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## EVAPORITIC KARST AND CAVES OF NORTHERN APENNINES

*“If you dig in the soil around here for a couple of hundred cubits, you will only find a layer of salt, and it is the same everywhere in the Bottomlands. [...] For geologists it was one of the first signs of the fact that the Bottomlands were once a sea.”*

*Down in the Bottomlands, Harry Turtledove*

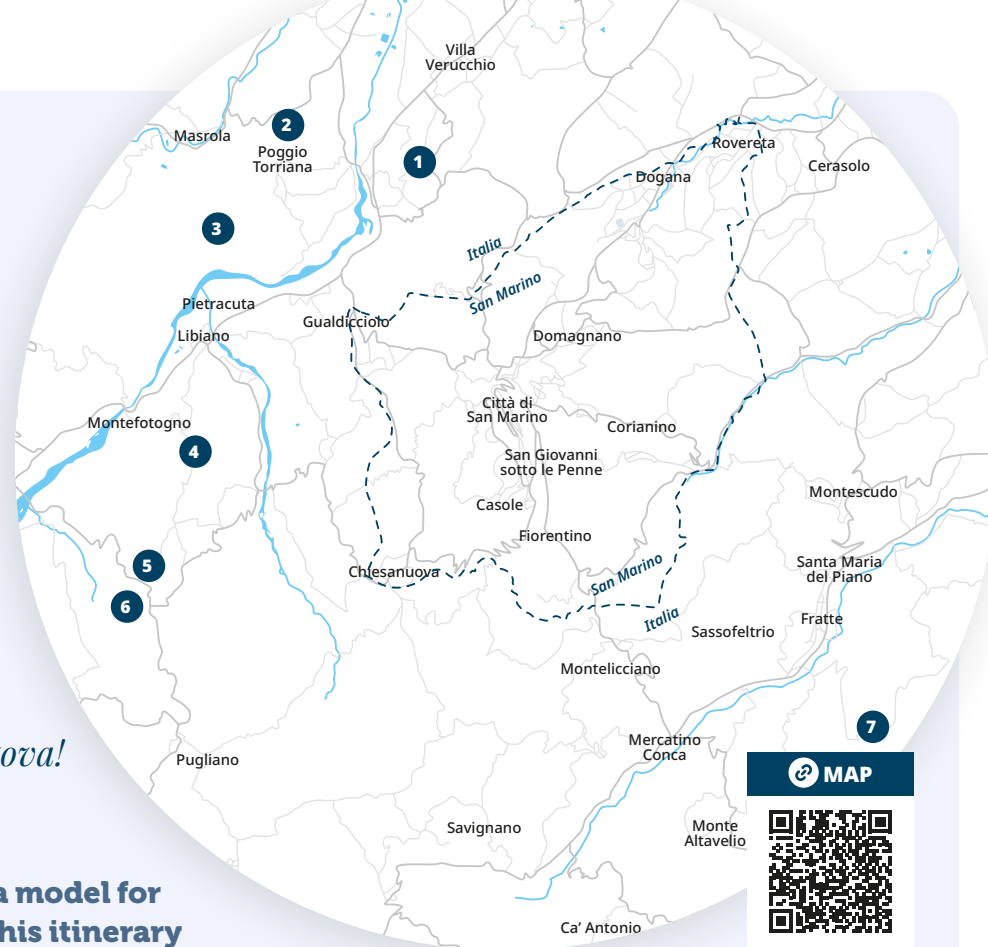
In orbit in a space station in transit above Europe, recognising the Mediterranean would almost be an instinctive reflex. But catapulted 5 million years back in time, in the heart of the Messinian Stage, the landscape outside the window would be unrecognisable: the coastlines have disappeared into an immense and arid plain which replaces the liquid expanse of Mare Nostrum; with the Strait of Gibraltar closed, the Mediterranean has inevitably evaporated; in the lowest parts, the residual basins receive water from the rivers that come down from the mainland, but the rates of evaporation are so high that the salts precipitate, transforming the plains into endless white salt pans; cyclical phases of drying and flooding cause the deposit of dozens of metres of mineral salts, including chalk. After the Strait of Gibraltar reopened, the Mediterranean at last went back to being a sea. The tectonic thrusts raised the bottom, bringing to the surface the Apennines as we can see them today. In the provinces of Reggio Emilia, Bologna, Ravenna and Rimini, a very peculiar combination of climate and geomorphological conditions allowed the preservation of the geological strata dating back to that distant past: the famous Emilia-Romagna gypsum. This serial site protects the astonishing geological landscape of the evaporitic deposit of the northern Apennines, the scenario and the witness at one and the same time of a fundamental chapter of the geological saga of planet Earth.



**SERIAL NATURAL HERITAGE**  
UNESCO DOSSIER: 1692  
PLACE OF INSCRIPTION: RIYADH, SAUDI ARABIA  
YEAR OF INSCRIPTION: 2023



**CRITERIA FOR SELECTION:** Thanks to the peculiar geological and climatic context and the concentration of surface karst forms, caverns, saline sources, minerals, speleothems and fossil remains, this serial site is a unique example of the geological processes that model the Earth's crust.



*“Men climb up to San Leo, or climb down to Noli, or surmount Bismantova! And all on foot, but this path must be flown.”*

**As Dante did, using these lands as a model for the gruelling climb to Purgatory, this itinerary plunges into the mesh of the landscape and the history of the Montefeltro region, browsing through the geology like a gigantic book of rock.**

Leave from **1 Verucchio**, which from the first heights in the shadow of San Marino was the cradle of the Malatesta dynasty. Its 14<sup>th</sup> century citadel looks out like a balcony on the handful of houses of the village and the bristly and tormented pattern of the hills, crossed by the course of the Marecchia River. Two other fortresses are perched on as many rocky spurs very close by, that of **2 Poggio Torriana** to the east and the Rocca dei Guidi di Bagno in **3 Montebello**.

In the ups and downs of the Earth's crust, which proudly shows off the “wounds” of its past, you will reach the tiny **4 Tausano**. The best way to contemplate the fantastic morphologies of the gypsum is through the excursion (CAI no. 95) along the crest of the Tausani Mountains, capable of revealing the same corners that were

captured by the paintbrush of Piero della Francesca. The alternative by road is the pleasant Via Tausano, which to the south joins the SP22. In both cases, the route is watched over by the almost Dolomitic profiles of the main gypsum peaks of the Marecchia: Monte Gregorio, Penna del Gesso and Monte San Severino.

Towards the south, immersed in the vegetation, the **5 Convent of Sant'Ighe**, dating back to the 13<sup>th</sup> century can be glimpsed. Only a couple of kilometres away, the wooded “epidermis” of the hills is ripped open by the powerful mass of **6 San Leo**, from the top of which stands the austere mass of the fort like the sentry of Montefeltro. At the foot of this dizzyingly high rock, the hamlet is one of the best preserved medieval gems in the region: once you have crossed

its threshold, you will be enraptured by the Romanesque suggestions of the Cathedral of San Leo and of the Pieve di Santa Maria Assunta, and by the quiet simplicity of the Torre Civica. In just under one hour, through the bends of the Montefeltro landscape and with an outing into the territory of the Marche region, you reach the borders of the Riserva Orientata di Onferno. Starting from the Visitors' Centre in Castello di Onferno, it is possible to start the “infernal” descent full of Dantesque echoes to the **7 Onferno Caves**, which of all the gypsum caverns is one of the most important karst complexes in Italy. Its powerfully fascinating natural architecture is the result of the thousand years of action of the water on the geological matrix and is a refuge for the largest colony of bats in the region.



## THE STONE OF BISMANTOVA

*“The traveller feels a violent emotion, a knot in the throat when [...] he sees for the first time rising to the sky the immense anvil of rock, from the carved out side and the flat and oblique summit, like an aircraft carrier that has been grasped and tilted in the middle of the mountains [...]. Everyone who looks at it has violet emotions, they seem to be short of breath for exactly this reason: because Bismantova, a geological squiggle, a minimum case of the cosmos but enormous in relation to man, reminds viewers obscurely and viscerally*

*of the misery and frailty of our destiny, and the anguish-filled mystery of matter, which has no purpose and yet exists, yet it can be seen and touched...”*

*Viaggio in Emilia Romagna, Mario Soldati*

Surrounded by a sacred halo, like the great aboriginal mass of Uluru (Ayers Rock), the Stone of Bismantova appears as a gigantic cliff of Miocene biocalcarene, against which the sea of the Reggio hills break. At its top, which exceeds 1000 metres, there is a vast grassy plain about 1 kilometre in length, reached by a close-knit network of paths which start from different places at its foot. La Pietra is mentioned by Dante, together with San Leo, as a term of comparison to describe the gruelling ascent of the mountain of Purgatory.



"IN BRISIGHELLA THERE ARE THREE CASTLES, / THEY ARE VERY BEAUTIFUL, THEY ARE GEMS, / WHEN YOU SEE THEM IT LOOKS AS THOUGH THERE ARE THREE OF THEM, / BUT IF YOU COUNT THEM AGAIN, THEY'VE GONE / BUT IF YOU COUNT THEM AGAIN, THEY'VE GONE...!"

This is how the song *The Castles of Brisighella* begins. It was written by Sandro Tuminelli and sung at the 20<sup>th</sup> Zecchino d'Oro (Italian children's song contest) by Salvatore Antonio

Folino. The "castles" it speaks about are the three pinnacles of rock on which Brisighella stands, with its medieval atmosphere making it a place completely entitled to enchant history enthusiasts. This itinerary, which starting from the village crosses the Regional Park of the Vena del Gesso Romagnola, follows the almost epic story of a mineral which is much more than just a sign on the school blackboard.

The best way of growing acclimatised is to walk through the arches and under the wooden ceilings of **1 Via del Borgo**, a raised walkway which was used by the neighbourhood's inhabitants to transport chalk from the

nearby quarries and not surprisingly also known as the Via degli Asini ("Donkeys' Path"). It was this precious mineral's trade that allowed Brisighella to flourish from as early as the Middle Ages. In a few minutes on foot, the journey into the past continues to the **2 Clock Tower**, which dominates the village from its rocky spur, offering breathtaking views with glimpses of the outcrops of dazzling white gypsum dotting the surrounding landscape. Now look eastwards and, after having taken the panoramic path, you will reach the massive towers of the **3 Rocca Manfrediana**, which, as its name suggests, was part of the lands of the Manfredi family and then fell into the hands of the Venetians. In its rooms, there is the Museum of Man and Chalk, which explores the long history of the mineral which is the symbol of this area, inhabited since prehistory. One of the most fascinating stories is that of the *lapis specularis*, the particular variety of chalk with large transparent crystals and easily split apart which was used for windows in Roman times. On the other side of Via Rontana, very near the Rocca, you can have a first close contact with the natural deposits of chalk at the **4 Open-air Geological Museum in Monticino**. The route in the open allows winding back and going over the history of the Vena del Gesso in the last 15 million years and getting to know the fossil fauna (reconstructed) which was found in the main rock formations. Continuing for another couple of kilometres in the hills, you reach the **5 Ca' Carnè Mountain Hut Visitor Center**, where you can arrange guided speleological routes which explore the Grotta della Tanaccia. The Path of Abysses also goes from the Centre into the Vena del Gesso Park to discover the most fascinating and surreal shapes of the karst landscape, with sinkholes and abysses.



## KARST in books

Reading suggestions to explore the landscapes of the northern Apennines.

• **The Divine Comedy**, Dante Alighieri (1314-21). In the great masterpiece of literature, Dante baptises not only the Italian language, but also a literary collective imagination on the land of a country that had not yet been born. His deep knowledge of the Apennines is a pool of "images" from which the "total" writing of the poet draws with full hands.

• **The Gadfly**, Ethel Lilian Voynich (1897). This tells the story of the epic of the Risorgimento, in a novel of 1897 which, strangely enough, enjoyed immense success in the English-speaking world and in the former Soviet bloc countries, remaining practically unknown in the country where the story is set. At the centre is the existential crisis of Arthur Burton, a Byronic and passionate hero who will

become the gadfly that criticises power, up to a dramatic ending set between the walls of the Brisighella citadel.

• **Down in the Bottomlands**, Harry Turtledove (1993). This uchronic novel is set in a Europe where the Strait of Gibraltar has never opened and where the Mediterranean Sea has remained the arid and wild depression of the Miocene, but transformed into a reserve called the Bottomlands. The imaginary nations of this world without a sea are in a precarious geopolitical equilibrium, while a catastrophe looms over the Neanderthal ranger Radnal and his nation.

• **Dove il vento si ferma a mangiare le pere**, Mario Ferraguti (2010). This is a story in search of stories: the ones that the main character finds again going back to the source, retracing his footsteps in the village where his father was born in the Emilian Apennine. It is a novel about stories that are found again, oral traditions and legends on

the real and imaginary beings that give substance to the imagination and to the popular culture of those who live in the "uplands" of Emilia.

• **Viaggio in Emilia Romagna**, Mario Soldati (2020). The always accurate and enlightening visions on Italy by Mario Soldati examine the human and landscape differences of Emilia and Romagna, giving rise to pages where the truth of the anthropological "recording" can be adorned by vibrant and never rhetorical poetry.

### Children's books:

• **Una terra fantastica**, Francesco Rivola, Veronica Chiarini (2021). A sense of magic and legend is released from the odd geology and landscapes of the Vena del Gesso in Romagna. Through the double track of stories from popular culture and natural marvels, the book is a guide to get closer to the nature and the legends of this magic area.